Version 1.0 September 2009

Food Waste Management Cost Calculator

The Food Waste Management Calculator estimates the cost competitiveness of alternatives to food waste disposal, including source reduction, donation, composting, and recycling of yellow grease. Specifically, the calculator (1) develops an alternative food waste management scenario based on: your waste profile, availability of diversion methods, and preferences; and (2) compares cost estimates for a disposal versus an alternative scenario. The Cost Calculator demonstrates that environmentally and socially responsible food waste management is cost-effective for many facilities and waste streams. The more you know about your current waste management costs, the more accurate the calculator's estimate will be, but default values are provided for many variables.

To use this Cost Calculator, navigate to the **Inputs tab**. There you will specify your type of organization (Grocery Store, Hospital, K-12 School, Restaurant, University, Prison, or Other Institutional Cafeteria); types and quantities of food waste; and availability of food recovery method(s). The Inputs tab has notes and instructions to guide you.

Based on your inputs and associated costs, the **Cost Calculator tab** displays the 1-, 3-, 6-, and 10-year costs associated with food waste disposal versus an alternative scenario developed for your facility.

The **Cost Data tab** provides default data including composting cost data and transportation costs. Users are encouraged to provide their own data for these costs if available. Cost data collected from sources dated before 2008 are adjusted for inflation.

The **Cost Graphs tab** graphically portrays the changes in cost over time between the baseline and alternative scenarios developed for your facility based on your inputs and Cost Calculator results.

The **Benefits tab** provides a summary of the environmental and other benefits associated with food waste diversion.

The **Composting Environmental Benefits tab** estimates changes in variety of environmental measures based on the alternative scenario developed for your facility. This tab only measures changes resulting from composting preferences selected on the Inputs tab. The tab also provides a link to EPA's WAste Reduction Model (WARM), which estimates greenhouse gas (GHG) emissions of baseline and alternative waste management practices. You may enter the results of the Cost Calculator into WARM to estimate the change in GHGs from the baseline to the alternative scenario from composting.

The **Summary tab** provides brief review of the alternative food waste scenario based on your inputs and preferences, and summarizes the scenario's financial and environmental results compared to the baseline.

The **Resources** tab provides a summary of EPA's food waste hierarchy, as well as descriptive information and links to additional resources, including resources on the local availability of alternative food waste management methods.

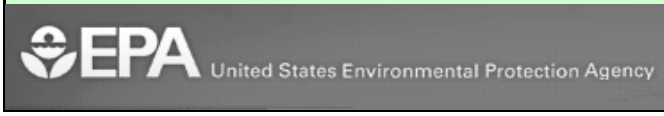
The **Default Cost Data tab** is a static version of the Cost Data tab. Refer to it if you change default data in the Cost Data tab, and subsequently want to re-enter default values.

The **Lookup tab** contains calculator programming.

The **Waste Logbook tab** provides an example of a food waste tracking spreadsheet that you can use to better characterize the quantity and nature of your food waste. Tracking food waste over time can help identify areas in which your operations can reduce food waste and achieve cost savings.

Final Note: Macros need to be enabled for the calculator to work properly. Each time you run the calculator, you should save the file under a different file name to maintain a complete record. The file name will appear at the top of each printed page.

Please direct questions or comments on this cost calculator to: Jean Schwab, U.S. EPA, schwab.jean@epa.gov, 703-308-8669



Food Waste Management Inputs

Source Reduction		Notes and Instructions
What type of facility are you?	Grocery Store	Choose the facility type that best fits the description of your business.
How many pounds of non-perishable food waste do you generate per week?	0	**Food Waste Definitions:** - Non-perishable food waste - surplus food that does not require refrigeration. Non-pershable food waste is eligible for food bank donation. - Pre-consumer prepared/whole food waste- surplus cooked foods and prepared meals that have not been purchased or plated. Pre-consumer prepared/whole food waste is eligible for food rescue. - Pre-consumer trim waste - food waste generated during food preparation, such as fruit rinds, vegetable scraps, and meat trimmings. - Post-consumer plate waste - food that is plated, but not eaten by the consumer. If you are having trouble determining the quantity of food waste your facility generates per week, review the Waste Generation table on the Cost Data tab for suggested rates by facility type. Click on this cell to go directly to this table.
What percentage of non-perishable food waste are you willing to source reduce?	0%	
How many pounds of pre-consumer prepared/whole food waste do you generate per week?	0	
What percentage of pre-consumer prepared/whole food waste are you willing to source reduce?	0%	
How many pounds of pre-consumer trim waste do you generate per week?	0	
What percentage of pre-consumer trim waste are you willing to source reduce?	0%	
How many pounds of post-consumer plate waste do you generate per week?	0	
What percentage of post-consumer plate waste are you willing to source reduce?	0%	**Source Reduction and Food Waste Tracking:** Source reduction, the practice of reducing the overall volume of food waste generated, leads directly to cost savings, avoided purchases, and subsequent waste hauling fees. Many institutions have succeeded at source reduction by decreasing portion sizes, eliminating food service trays in cafeterias, and using a la carte menus. To achieve source reduction, many facilities will require some form of food waste tracking. Paper tracking is simple and inexpensive, but may be time consuming and less accurate than automated tracking. Automated tracking can more expensive, but is likely more effective at targeting wasteful practices. A typical automated system costs $600 per month, and may typically result in source reduction of 3% or more. **The costs of food tracking have not been incorporated into this calculator; however, facilities looking to achieve cost savings from source reduction should consider these costs.** Enter your source reduction goals for each food waste category in the cells to the left. For more information, see Source Reduction and Food Waste Tracking on the Resource tab, or click this cell.
How much yellow grease do you generate per week?	0	Pounds — Yellow grease consists of used frying oils. Yewllow grease does not include trap grease. The amount of yellow grease generated per week can be entered in pounds or gallons. Choose the appropriate unit in the drop-down box on the left.
What is your average purchasing cost per pound for non-perishables?	$0.00	Purchasing costs per pound by food category may vary greatly depending on the size of your facility and menu. A food/waste audit could help you determine your facility-specific costs per pound. LeanPath, Inc. estimates that median cost across all food categories is $1.17 per pound. If costs per pound data is not available for your facility, you may wish to enter LeanPath's estimate for each food category located on the right.
What is your average purchasing cost per pound for pre-consumer prepared/whole foods?	$0.00	
What is your average purchasing cost per pound for foods that comprise trim and plate waste ?	$0.00	
Non-Perishable Food		
Does your facility have access to a local food bank that will accept non-perishable foods?	No	To locate a local food bank near you, visit http://feedingamerica.org/foodbank-results.aspx or click this cell.
Pre-Consumer Prepared/Whole Foods, Trim Waste, and Plate Waste		
Food Rescue		
Does your facility have access to a local food rescue service that accepts prepared meals?	No	Food rescue, also called food recovery, is the practice of safely retrieving edible food that would otherwise go to waste and distributing it to those in need. For more information, see Food Rescue on the Resources tab or click this cell.
Feeding Animals		
Do you have access to a local farm that accepts food scraps to feed animals?	No	For more information on feeding animals, see Food Diversion to Animal Feed on the Resources tab, or click this cell.
Composting		
Does your facility have the ability to compost outdoors at your site?	No	You can create a compost pile at your facility, depending on your available outdoor space. For more information, see On-site Outdoor Composting on the Resources tab, or click this cell.
Are you willing to purchase and operate an in-vessel composter at your facility?	No	In-vessel composting requires the purchase of a special composting vessel designed to promote the airflow and temperature necessary for enclosed composting. For more information, see In-Vessel Composting on the Resources tab, or click this cell.
Do you have access to off-site composting?	No	Off-site composting requires accessibility to a local composting facility that will accept food waste. For more information, see Off-Site Composting on the Resource tab, or click this cell.
How much, if anything, are you paid per pound, for compost you are able to sell?	$0.00	This cell does not apply for off-site composting. If you select off-site composting. Leave this cell blank.
Of the composting methods available, select the one that you would you prefer to use at your facility? Choose a blank space if you prefer not to compost.		To assist in determining which composting method might work best for you, the table to the right indicates cost savings associated with each available composting method. Note that some methods may not be cost-effective.
This answer is required for the calculator to work properly.		
Yellow Grease		
Does your facility have access to a biodiesel collection or processing service?	No	For more information on yellow grease recycling, see Industrial Uses -- Yellow Grease on the Resources tab, or click this cell.
Waste Hauling Cost		
How are your hauling fees calculated?	By Weight	Choose the waste hauling fee structure that best matches your facility's operations.
How much are you charged per ton hauled?		
Are you charged an annual rental fee for your hauling container(s)?		
Pulper		
Would you be willing to purchase a pulper to reduce the weight of your food and reduce your hauling fees?	No	By default the Food Waste Calculator assumes that pulpers reduce weight of food waste by 20 percent. Actual reductions vary by the type and size of pulper and food waste processed. For example, food with a high water content (e.g., fruit) will release more water in the pulping process than food with low water content (e.g., high fat foods). To adjust the weight reduction percentage, click this cell.

Composting Method	Estimated Total Savings per Year	Cost Effective Over 10 Years
Outdoor	N/A	Not Available
In-Vessel*	N/A	Not Available
Off-Site	N/A	Not Available

*In-Vessel Costs do not include initial cost of composter.
**Estimates do not include separation costs until preferred composting method is selected. Negative results reflect increased costs.

Food Waste Management Cost Calculator

Baseline Scenario of 100% Disposal	Costs are Cumulative 1 Year	3 Years	6 Years	10 Years
Non-Perishable Food Waste	$0	$0	$0	$0
Pre-Consumer Prepared/Whole Food Waste	$0	$0	$0	$0
Pre-Consumer Trim Waste and Post-Consumer Plate Waste	$0	$0	$0	$0
Yellow Grease	$0	$0	$0	$0
Fixed Cost of Disposal (i.e., Fixed Hauling Costs)	$0	$0	$0	$0
Total Cost of 100% Disposal	**$0**	**$0**	**$0**	**$0**

Notes on Baseline Costs:
- If both prepared/whole food waste and trim/plate waste are being composted in-vessel, costs are split evenly between the two categories.

Alternative Scenario: Source Reduce, then use Cost-Effective Waste Management Strategies, Dispose of Remaining Waste	1 Year	3 Years	6 Years	10 Years
Food Waste Separation	$0	$0	$0	$0
Initial Cost of Pulper	$0	$0	$0	$0
Initial Cost of In-Vessel Composter	$0	$0	$0	$0
Non Perishable Food Waste				
Food Waste Diversion Strategy: Disposal	$0	$0	$0	$0
Pre-Consumer Prepared/Whole Food Waste				
Food Waste Diversion Strategy: Disposal	$0	$0	$0	$0
Pre-Consumer Trim Waste and Post-Consumer Plate Waste				
Food Waste Diversion Strategy: Disposal	$0	$0	$0	$0
Yellow Grease				
Food Waste Diversion Strategy: Disposal	$0	$0	$0	$0
Fixed Cost of Disposal (i.e., Fixed Hauling Costs)	$0	$0	$0	$0
Total Cost of Alternative Management Methods	**$0**	**$0**	**$0**	**$0**

Notes on Alternative Scenario Costs:
- Negative values represent net cost savings associated with the alternative scenario (i.e., if savings from donations and selling compost are higher than the costs).
- If both prepared/whole food waste and trim/plate waste are being composted in-vessel, costs are split evenly between the two categories.
- Food separation costs include the cost of toters, liner bags, and staff training. See Food Separation costs on the Cost Data tab, or click this cell.

Comparison of Alternative Scenario to the Baseline	1 Year	3 Years	6 Years	10 Years
Cost Savings from Source Reduction (i.e., Lower Purchasing Costs)	$0	$0	$0	$0
Cost Savings: Alternative Scenario Compared to Baseline Scenario [= Row 9 - Row 24]	$0	$0	$0	$0
Total Savings: Alternative Scenario and Source Reduction Compared to Baseline Scenario [= Row 27 + Row 28]	**$0**	**$0**	**$0**	**$0**

Notes on Cost Comparison:
- Negative values represent net costs associated with alternative scenario.

Quantity of Waste Disposed, Diverted and Source Reduced (Lbs Per Year)	Disposed	Diverted	Source Reduced
Baseline Scenario	**0**	**-**	**-**
Alternative Scenario	**0**	**0**	**0**

To view a summary of the alternative scenario, including potential cost savings and environmental benefits, see the Summary tab, or click this cell.

Food Waste Management Cost Data

Food Waste Generation Data	Lbs. per meal	Tons per month	Tons Per Week (Approximate)	Source
Supermarkets	n/a	5 to 45	1 to 10	
Hotels	1 to 1.5	10 to 30	2 to 7	
Catering Halls	1 to 1.5	8 to 30	2 to 7	
Institutions	0.75 to 1	5 to 30	1 to 7	
Restaurants	0.5 to 1.5	4 to 20	1 to 5	
Hospitals	0.5 to 1	8 to 14	2 to 3	
Nursing Homes	0.75 to 1	3 to 9	1 to 2	Data provided by Priscilla Hayes, Environmental
Corporate Offices	0.5 to 0.75	3 to 8	1 to 2	Coordinator, Rutgers University on Oct. 24, 2008.

In-Vessel Composting Cost	Unit	Cost Estimate	Source	Comments
Initial Cost	$	$39,000.00	John Willis, BW Organics, November 4, 2008.	These figures will not be accurate for facilities
Energy Cost	$/ton	$40.00	Dr. Nicholas Smith-Sebasto, Montclair University. October 23, 2008	generating over 500 pounds of food waste per day. If your facility generates more than that
Repair Cost	$/Year	$250.00	John Willis, BW Organics, November 4, 2008.	amount, please enter your own data in the green
Maintenance Cost	$/Year	$120.00	John Willis, BW Organics, November 4, 2008.	cells to the left.
Labor Cost	$/ton	$53.41	Dr. Nicholas Smith-Sebasto, Montclair University. October 23, 2008	

Pulping Costs

Small Pulper	Unit	Cost Estimate	Source	Comments
Initial Cost	$	$24,062	In-Sink-Erator Customer Service. October 16, 2008. This data is for the In-Sink-Erator WX-300.	In-Sink-Erator was unable to provide a cost estimate for the energy cost of the WX-300. Therefore, the value that Hobart provided for the WastePro 1200 is used for both the WastePro 1200 and the WX-300
Capacity	pounds/hour	700		
Energy Cost	$/ton hydrated food	$1.07	Communication with Allen Haskin, Hobart, from August 11, 2009 to August 24, 2009.	

Large Pulper	Unit	Cost Estimate	Source	Comments
Initial Cost	$	$40,000	Communication with Allen Haskin, Hobart, from August 11, 2009 to August 24, 2009. This data is for the WastePro 1200	
Capacity	pounds/hour	1,250		
Energy Cost	$/ton hydrated food	$1.07		

Food Waste Weight Reduction	Unit	Estimate	Source	Comments
Reduction	%	20%	Communication with Allen Haskin, Hobart, from August 11, 2009 to August 24, 2009	Hobart tests of the WPS have showed the weight of the pulped waste are reduced by 10-30 percent

Transportation Costs	Unit	Cost Estimate	Source	Comments
Gas and Vehicle Maintenance	$/Mile	$0.585	U.S. General Services Administration. *Privately Owned Vehicle Mileage Reimbursement Rates.* August 1, 2008.	
Driver Wage	$/mile	$0.33	Arabe, K.C., Driver Pay Significantly Affects Safety: Industrial Market Trends. December 12, 2002.	If you have your own data on driver wage, enter it in cell C21.

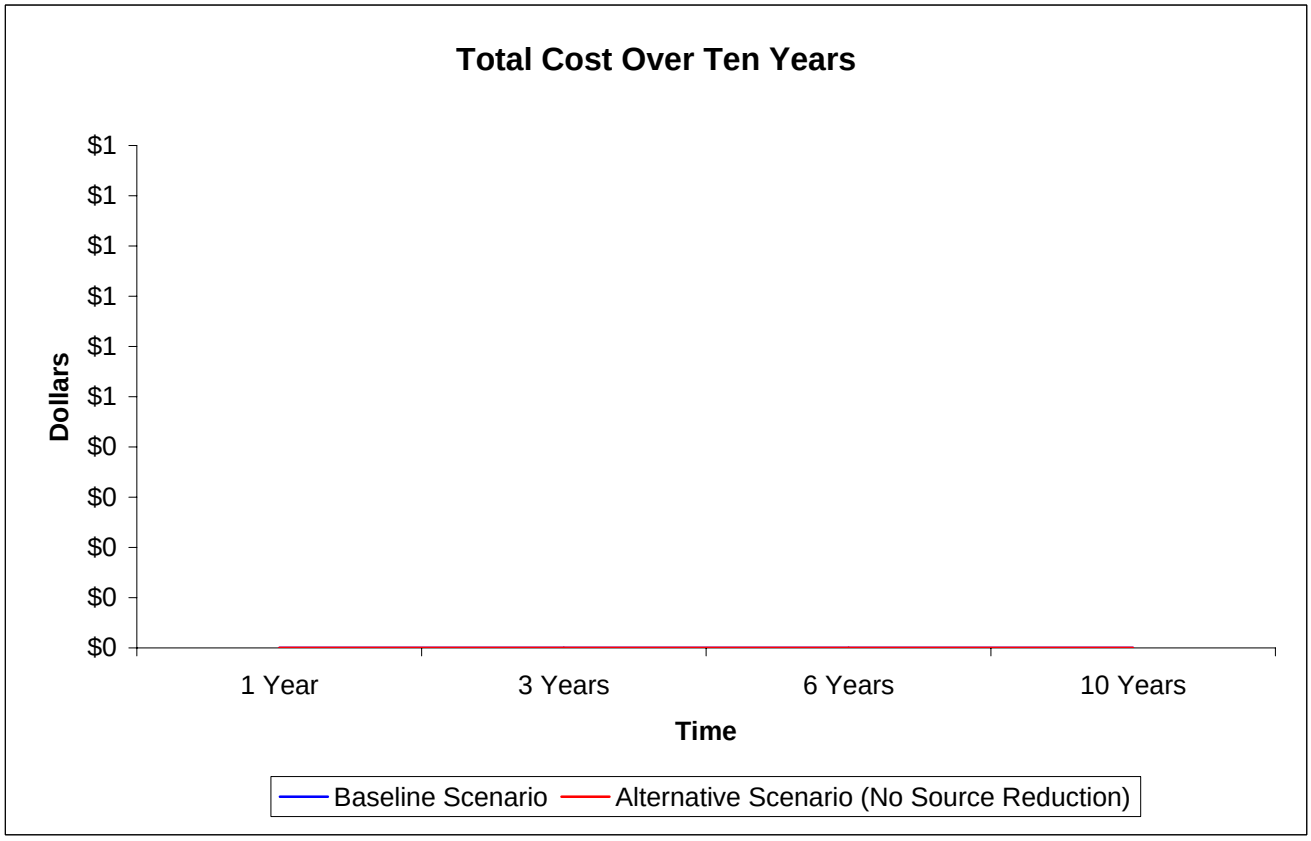
Food Waste Separation Costs	Unit	Cost Estimate	Source
Initial Cost of toters, printing materials, and training	Initial Cost to Separate 1 ton of food waste per day	$1,100	
Annual Cost of 30-gallon trash liner bags	Annual Cost to Separate 1 ton of food waste per day	$1,200	Massachusetts Supermarket Composting Handbook, p. 3-5. http://www.mass.gov/dep/recycle/reduce/smhandbk.pdf

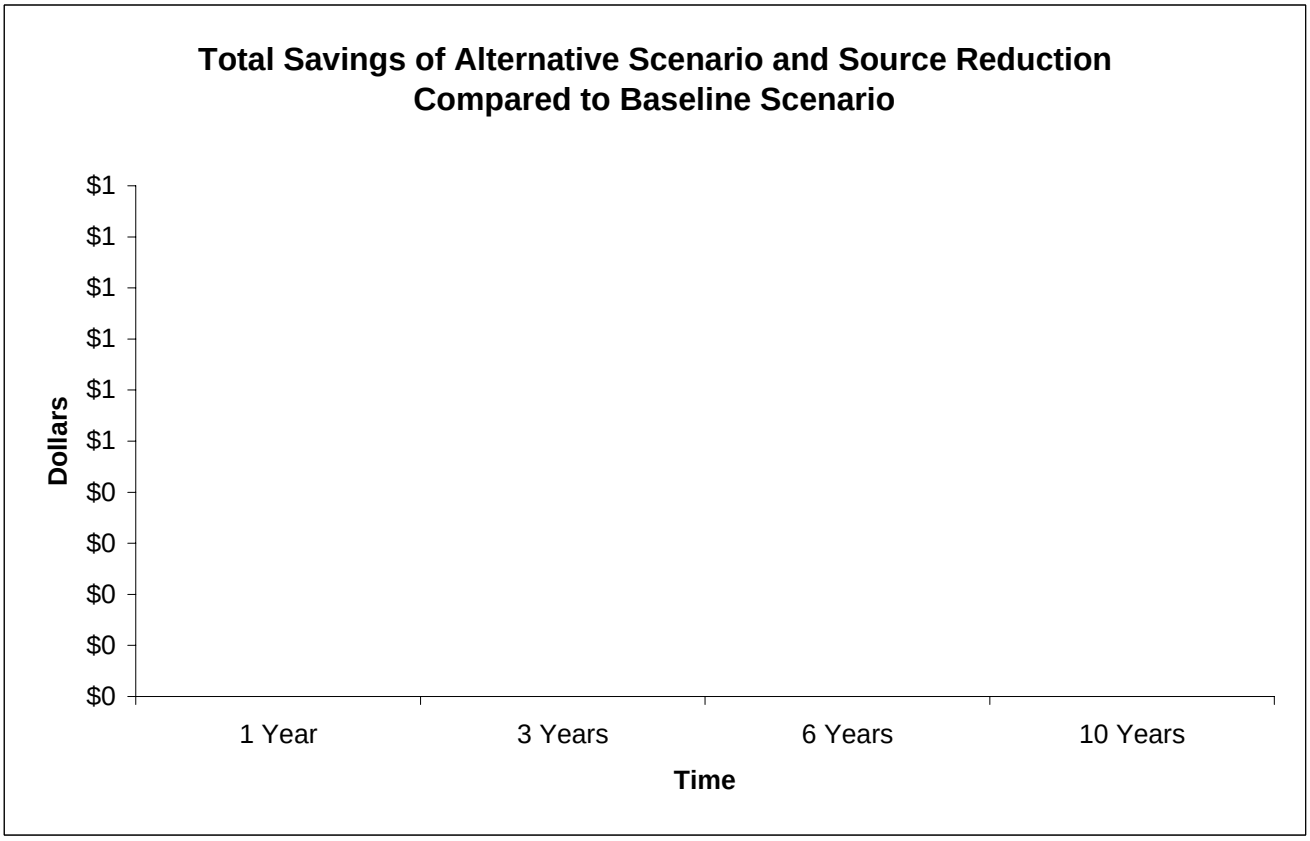
Food Prep Labor Wage	$/Hour	Source
Wage	$9.54	May 2007 National Occupational and Wage Estimate for Food Preparation and Serving. U.S. Department of Labor, Bureau of Labor Statistics. http://www.bls.gov/oes/current/oes_nat.htm#b35-0000

Conversion Factors	From	To	Factor
Food Waste to Compost	Pounds food waste	Pounds Compost	0.2
Yellow Grease	Gallons	Pounds	7.7

Inflation Adjustment Table	
One Dollar in…	Equals this many 2008 Dollars
2000	$1.23
2001	$1.20
2002	$1.17
2003	$1.15
2004	$1.12
2005	$1.08
2006	$1.05
2007	$1.02

Food Waste Management Cost Graphs





Food Waste Diversion Benefits

Diverting food waste has several environmental and social benefits:

Improves land use

Food waste diversion reduces demand for landfill space and preserves land for higher and better use.

Source reduction decreases the acreage of land necessary for food production and the environmental impacts associated with farming (e.g., fertilizer and pesticide use, water pollution, and some forms of air pollution) as well as the impacts associated with food transportation.

Fights Climate Change

The anaerobic decomposition of food waste in landfills releases methane, a greenhouse gas (GHG) 21 times more potent than carbon dioxide. Landfills account for 23% of US methane emissions and are the second largest anthropogenic source of methane in the country.* Diverting food from landfills and incinerators lowers GHG emissions. Industrial Use programs that convert food oil to fuel reduce fossil fuel energy consumption and also decrease GHG emissions.

Protects soil through composting

Compost enriches poor soils, serves as an erosion deterrent, increases the water retention capacity of the soil, and can be used as a substitute to fossil fuel based fertilizers in some applications.

Strengthens organizations and communities

Americans throw away more than 25% of the food we prepare. Establishing a food waste diversion program helps to feed the hungry and alleviate food shortages at food pantries and soup kitchens. Diverting food to pantries and food rescue organizations is recognized as the right thing to do by employees and community members. Organizations can develop good will and positive outreach programs around food waste diversion programs.

*U.S. Emissions Inventory 2009: Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007

Environmental Benefits of Composting

To view a summary of the alternative scenario, including potential cost savings and environmental benefits, see the Summary tab, or click this cell.

TABLE 1: Quantity of Annual Food Waste Composted in the Alternative Scenario		
Food Waste Category	**Pounds**	**Tons**
Pre-Consumer Prepared / Whole Foods	-	-
Pre-Consumer Trim Waste	-	-
Post-Consumer Plate Waste	-	-
Total Pounds	**-**	**-**

Greenhouse Gas Emissions Reductions From Composting

To evaluate greenhouse gas (GHG) emissions reductions resulting from composting your food waste according to the alternative scenario, EPA recommends that you use the WAste Reduction Model (WARM). EPA created WARM to help solid waste planners and organizations track and voluntarily report greenhouse gas emissions reductions from several different waste management practices. The latest version of WARM is available both as a Web-based calculator and as a Microsoft Excel spreadsheet and can be accessed at:

http://www.epa.gov/climatechange/wycd/waste/calculators/Warm_home.html

Similar to the Food Waste Management Cost Calculator, WARM requires you to enter baseline and alternative management scenarios. To estimate potential GHG reductions from composting activities based on the alternative food waste scenario, enter total quantity composted in tons from Table 1 (above) into WARM's Baseline (Step 1) "Tons Landfilled" column for food scraps. Then, enter the same quantity into the Alternative Management Scenario (Step 2) into the "Tons Composted" column for food scraps. To view results, set the remainder of WARM's assumptions for landfilling characteristics and transport distance. WARM provides you with tips to set these settings.

Potential Reductions Life-Cycle Environmental Impacts From Composting

Using compost can reduce or eliminate the need to apply fertilizers and pesticides on lawns, gardens, and other landscaping. Table 2 shows potential reductions in environmental impacts resulting from composting under the alternative scenario. The emissions reduction factors, developed using life-cycle assessment (LCA) methods, assume that composting will result in a 50% reduction and fertilizer use. The environmental impact categories are presented in terms of the equivalent pounds of a common pollutant (e.g., carcinogens are measured in pounds of benzene equivalent). For more information on LCA methodology, see:

http://www.epa.gov/nrmrl/lcaccess/index.html

TABLE 2: Annual Potential Reductions in Environmental Impacts From Composting

Environmental Impact Category	Description	Emissions Factor* (Lbs / Ton Composted	Unit Equivalents	Pre-Consumer Prepared / Whole Foods (Lbs)	Pre-Consumer Trim Waste (Lbs)	Post-Consumer Plate Waste (Lbs)	Total (Lbs)
Particulates	Particulate matter, also known as particle pollution or PM, is a complex mixture of extremely small particles and liquid droplets. Particle pollution is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. PM 2.5 represents 2.5 micrometer particulate matter. For information on the health effects of PM, see http://www.epa.gov/oar/particlepollution/health.html, or click this cell.	1.3	PM2.5	0.0	0.0	0.0	**0**
Toxics	In this analysis, potential toxics reduction is measured in equivalents of toluene, a highly toxic chemical typically used in the production of gasoline and other hydrocarbons. For information on the toxicity and heath hazards of toluene, see http://www.epa.gov/ttn/atw/hlthef/toluene.html, or click this cell.	739.1	Toluene	0.0	0.0	0.0	**0**
Carcinogens	The term "carcinogen" refers to agents that directly promote or cause cancer. In this analysis, potential carcinogen reductions are measured in equivalents of benzene, a common cancer-causing agent found in gasoline and other chemicals. For more information on the health effects of benzene, see http://www.epa.gov/ttn/atw/hlthef/benzene.html, or click this cell.	0.3	Benzene	0.0	0.0	0.0	**0**
Eutrophication	Eutrophication is a process whereby water bodies, such as lakes, estuaries, or slow-moving streams receive excess nutrients that stimulate excessive plant and algae growth. This enhanced growth, often called an algal bloom, reduces dissolved oxygen in the water when dead plant material decomposes and can cause other organisms to die. In this analysis, reduction in potential eutrophication is measured in nitrogen (a common nutrient) equivalents. For more information on eutrophication, see http://toxics.usgs.gov/definitions/eutrophication.html, or click this cell.	5.2	Nitrogen	0.0	0.0	0.0	**0**
Acidification	Acidification results from depositing of acids, which originate from anthropogenic emissions of the three main pollutants: sulfur dioxide (SO2), nitrogen oxides (NOx), and ammonia (NH3). Acid deposition leads to effects on soil, water bodies, vegetation, buildings and infrastructure. In this analysis, reduced potential for acidification is measured in equivalents of SO2. For more information on acid deposition, see http://www.epa.gov/acidrain/, or click this cell.	5.8	SO2	0.0	0.0	0.0	**0**
Ecosystem Toxicity	Ecosystem toxicity is defined as the potential of a chemical released into the environment to cause harm to plants or animals. In this analysis, reduction in ecosystem toxicity are measured in equivalents of 2,4-Dichlorophenoxyacetic acid (2,4-D), common systemic herbicide used in the control of broadleaf weeds. For more information on the environmental impacts of 2,4-D, see http://epa.gov/oppsrrd1/REDs/factsheets/24d_fs.htm, or click this cell.	4.5	2,4-D	0.0	0.0	0.0	**0**

Source: Morris, Jeffery, Sound Resource Management, "Documentation for the Valuation of Environmental Benefits of Recycling and Composting Material." June 30, 2008.

Food Waste Management Calculator Results

Based on your selections and inputs, the most environmentally-friendly and cost-effective food waste management scenario for you to employ at your facility is as follows:

Food Waste Type	Food Waste Diversion Strategy
Non-Perishable Food Waste	Disposal
Pre-Consumer Prepared/Whole Food Waste	Disposal
Pre-Consumer Trim Waste	Disposal
Post-Consumer Plate Waste	Disposal
Yellow Grease	Disposal

Congratulations! Based on your inputs, you would source reduce 0 pounds of non-perishables, 0 pounds of pre-consumer prepared/whole foods, 0 pounds of pre-consumer trim waste, and 0 pounds of post-consumer plate waste for a total of 0 pounds annually.

If you employ the management methods listed above, your facility would save roughly 0 after 1 year and 0 after 10 years.

Annually, based the quantity of food waste composted, your facility could potentially reduce the following:

-Particulates equivalent to reducing 0 pounds of PM2.5, which has been linked to respiratory and heart disease. Reducing this level of PM2.5 emissions is equivalent to removing 0 cars off the road for one year.

-Toxics equivalent to 0 pounds of toluene, a toxic chemical that has been found to have acute, long-term, and developmental effects on human heath.

-Carcinogens equivalent to 0 pounds of a benzene, a toxic chemical proven to cause leukemia in humans.

-Eutrophication equivalent to 0 pounds of nitrogen, commonly used as a nutrient in fertilizers.

-Acidification equivalent to 0 pounds of sulfur dioxide (SO2) per year. SO2 has been linked to acid rain, which damages trees, crops, historic buildings, and monuments; and makes soils, lakes, and streams acidic. This level of SO2 emissions is equal to the amount of SO2 generated during the production of 0 Kilowatt-Hours of electricity at the most polluting power plant (in terms of SO2) in the US.

-Ecosystems toxicity equivalent to 0 pounds of 2,4-D, a commonly used agricultural and residential pesticide.

Back to Inputs Tab

References, Definitions, and Additional Resources

Food Waste

Food leftovers are the single-largest component of the waste stream by weight in the United States. Food waste includes uneaten food and food preparation scraps from residences or households, commercial establishments such restaurants, and institutional sources such as school cafeterias. Americans throw away more than 25 percent of the food we prepare, about 96 billion pounds of food waste each year. In total, the nation spends about 1 billion dollars a year to dispose of food waste.

Food Waste Recovery Hierarchy

EPA has developed a food waste recovery hierarchy to illustrate how productive use can be made of excess food. The hierarchy emphasizes practices that provide the greatest ecological, economic, and social benefits, with disposal as the last option.

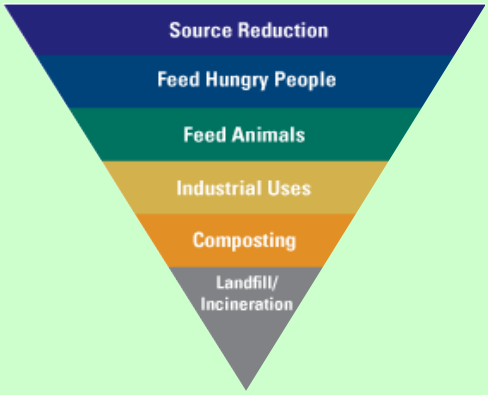
Source Reduction – Reduce the volume of food waste generated by aligning food supply more closely with food demand.

Feed Hungry People – Donate extra food to food banks, soup kitchens and shelters. For more information, refer to EPA's guide titled "Feeding the Hungry and Reducing Solid Waste through Food Recovery" at http://www.epa.gov/epawaste/conserve/materials/organics/pubs/wast_not.pdf

Feed Animals – Provide food to farmers to use as animal feed.

Industrial Uses – Provide fats, oils, and greases (FOGs) for biodiesel production or certain types of food scraps for rendering.

Composting – Convert food scraps into a nutrient rich soil amendment through aerobic decomposition. For more information, refer to EPA's "Guide to Commercial Food Composting" at: http://www.epa.gov/epawaste/conserve/materials/organics/food/fd-guide.htm



Source Reduction and Food Waste Tracking

Source reduction is the practice of reducing the overall volume of food waste generated. Typically, facilities identify and eliminate excess food waste through changes in food purchasing, storage, handling, and use. Source reduction leads directly to cost savings, resulting from avoided purchases and subsequent waste hauling fees. By separating food waste, businesses can inventory their excess food supply and implement appropriately targeted source reduction strategies. Facilities may track food waste through paper tracking or more sophisticated automated tracking systems. Paper tracking is typically not expensive, but may be time consuming. See the Waste Logbook tab for paper tracking template. Automated systems can reduce tracking time and help target specific areas (e.g., purchasing, spoilage, trim waste) for source reduction. For one example of an automated food waste tracking system, see:
http://www.leanpath.com/lpweb/index2.htm
For additional food waste tracking tips and tricks, see:
http://blog.leanpath.com/?page_id=618
Note: Identifying these websites does not constitute an endorsement by EPA of their products or services.

Food Waste Diversion Methods

Food Rescue

Food Rescue programs focus on the recovery of prepared meals and other perishable foods. For general information about this class of food recovery program and for details about the food preparation and delivery requirements, see:
http://feedingamerica.org/partners/product-partners/perishable-food.aspx

Food Banks

Traditional food bank programs focus on recovering and collecting non-perishable food items, generally distressed, surplus, or unsaleable products from grocery stores and supermarkets. Some food banks will also recover fresh produce. For general information about this class of programs, see:
http://feedingamerica.org/partners/product-partners/distressed-unsaleable-product.aspx

Food Diversion to Animal Feed

There are few formal programs to facilitate the diversion of food waste to animal feed, though conditions and available resources can vary throughout the country. To locate an interested livestock farmer, potential donors should begin by contacting a local university agricultural extension office or their county agricultural commissioner's office. General information for those interested in this management method is provided by the California Integrated Waste Management Board:
http://www.ciwmb.ca.gov/FoodWaste/AnimalFeed/

Industrial Uses -- Yellow Grease

Recovery of yellow grease to make biodiesel is an increasingly available option. Restaurants, kitchens, and other commercial food establishments may be able to locate a biodiesel company willing to pick-up their used yellow grease and convert those materials into biodiesel fuel. These companies will often provide the pick-up service free of charge. To identify a company, do an Internet search for the name of your city and "biodiesel collection." As an example of yellow grease collection service, information about two biodiesel companies in New York and Southern California is available at the following links:

http://nyc.tristatebiodiesel.com/collect.htm

http://www.newleafbiofuel.com/oilCollection/commitment.html

Note: Identifying these websites does not constitute an endorsement by EPA of their products or services.

On-Site Outdoor Composting

On-site composting can be done using two mechanisms: the traditional compost pile, discussed here, or through an in-vessel composter, discussed below. Given the availability of appropriate space and volume of appropriate wastes, certain facilities may already have a functional on-site compost pile or they may be interested in starting such a pile. Introductory information about the compost pile method, including necessary ingredients and applicable wastes, can be found at:

http://www.epa.gov/epaoswer/non-hw/composting/by_compost.htm

On-Site In-Vessel Composting

In-vessel composting is a process of composting in enclosed reactors such as metal tanks, through which air flow and temperature are controlled. There are many in-vessel composters that can be used on-site in commercial and institutional applications. Learn more at:

http://www.epa.gov/epaoswer/non-hw/composting/vessel.htm

If your facility generates over 500 pounds of food waste per day and you need site-specific cost data for in-vessel composting, you may want to contac the manufacturers below or contact a provider that services your area:

Green Mountain Technologies	http://www.gmt-organic.com/
NaturTech Composting	http://www.composter.com/composting/naturtech/
BW Organics, Inc.	http://www.bworganics.com/

Note: Identifying these websites does not constitute an endorsement by EPA of their products or services.

Off-Site Composting

Taking organics to a composting facility depends on the accessibility of local composting sites that will accept food and other organics. To find out about composting sites in your area, contact your state or local department of environmental protection, public works, or equivalent that has responsibility for solid waste. You can also use the following website to obtain a partial listing of composting facilities in your area:

http://www.findacomposter.com/

Other Considerations

Liability Protection

The Federal Bill Emerson Good Samaritan Food Donation Act protects individuals and corporations from liability when they make good faith donations of food and grocery products to non-profit organizations for distribution to needy individuals. Additional information about the Act is available through Feeding America, at:

http://feedingamerica.org/partners/product-partners/protecting-our-partners.aspx

Tax Deductions

Companies can usually take a tax deduction for donating food, although the amount of the deductions can vary greatly depending upon a number of factors encountered by the company:

- Whether the company is a "C" corporation, "S" corporation/partnership, or non-incorporated.
- What method of accounting is used for costs and expenses incurred in producing or acquiring the contributed food.

Donors are advised to consult with their tax advisor; overview information is available from Feeding America:

http://feedingamerica.org/partners/product-partners/tax-benefits.asp›

Food Waste Management Cost Data

Food Waste Generation Data	Lbs. per meal	Tons per month	Tons Per Week (Approximate)	Source
Supermarkets	n/a	5 to 45	1 to 10	
Hotels	1 to 1.5	10 to 30	2 to 7	
Catering Halls	1 to 1.5	8 to 30	2 to 7	
Institutions	0.75 to 1	5 to 30	1 to 7	
Restaurants	0.5 to 1.5	4 to 20	1 to 5	
Hospitals	0.5 to 1	8 to 14	2 to 3	
Nursing Homes	0.75 to 1	3 to 9	1 to 2	Data provided by Priscilla Hayes, Environmental
Corporate Offices	0.5 to 0.75	3 to 8	1 to 2	Coordinator, Rutgers University on Oct. 24, 2008.

In-Vessel Composting Cost	Unit	Cost Estimate	Source	Comments
Initial Cost	$	$39,000.00	John Willis, BW Organics, November 4, 2008.	These figures will not be accurate for facilities
Energy Cost	$/ton	$40.00	Dr. Nicholas Smith-Sebasto, Montclair University. October 23, 2008	generating over 500 pounds of food waste per day. If your facility generates more than that
Repair Cost	$/Year	$250.00	John Willis, BW Organics, November 4, 2008.	amount, please enter your own data in the green
Maintenance Cost	$/Year	$120.00	John Willis, BW Organics, November 4, 2008.	cells to the left.
Labor Cost	$/ton	$53.41	Dr. Nicholas Smith-Sebasto, Montclair University. October 23, 2008	

Pulping Costs

Small Pulper	Unit	Cost Estimate	Source	Comments
Initial Cost	$	$24,062	In-Sink-Erator Customer Service. October 16, 2008. This data is for the In-Sink-Erator WX-300.	In-Sink-Erator was unable to provide a cost estimate for the energy cost of the WX-300. Therefore, the value that Hobart provided for the WastePro 1200 is used for both the WastePro 1200 and the WX-300
Capacity	pounds/hour	700		
Energy Cost	$/ton hydrated food	$1.07	Communication with Allen Haskin, Hobart, from August 11, 2009 to August 24, 2009.	

Large Pulper	Unit	Cost Estimate	Source	Comments
Initial Cost	$	$40,000	Communication with Allen Haskin, Hobart, from August 11, 2009 to August 24, 2009. This data is for the WastePro 1200	
Capacity	pounds/hour	1,250		
Energy Cost	$/ton hydrated food	$1.07		

Food Waste Weight Reduction	Unit	Estimate	Source	Comments
Reduction	%	20%	Communication with Allen Haskin, Hobart, from August 11, 2009 to August 24, 2009	Hobart tests of the WPS have showed the weight of the pulped waste are reduced by 10-30 percent

Transportation Costs	Unit	Cost Estimate	Source	Comments
Gas and Vehicle Maintenance	$/Mile	$0.585	U.S. General Services Administration. *Privately Owned Vehicle Mileage Reimbursement Rates.* August 1, 2008.	
Driver Wage	$/mile	$0.33	Arabe, K.C., Driver Pay Significantly Affects Safety: Industrial Market Trends. December 12, 2002.	If you have your own data on driver wage, enter it in cell C21.

Food Waste Separation Costs	Unit	Cost Estimate	Source
Initial Cost of toters, printing materials, and training	Initial Cost to Separate 1 ton of food waste per day	$1,100	
Annual Cost of 30-gallon trash liner bags	Annual Cost to Separate 1 ton of food waste per day	$1,200	Massachusetts Supermarket Composting Handbook, p. 3-5. http://www.mass.gov/dep/recycle/reduce/smhandbk.pdf

Food Prep Labor Wage	$/Hour	Source
Wage	$9.54	May 2007 National Occupational and Wage Estimate for Food Preparation and Serving. U.S. Department of Labor, Bureau of Labor Statistics. http://www.bls.gov/oes/current/oes_nat.htm#b35-0000

Conversion Factors	From	To	Factor
Food Waste to Compost	Pounds food waste	Pounds Compost	0.2
Yellow Grease	Gallons	Pounds	7.7

Inflation Adjustment Table	
One Dollar in…	Equals this many 2008 Dollars
2000	$1.23
2001	$1.20
2002	$1.17
2003	$1.15
2004	$1.12
2005	$1.08
2006	$1.05
2007	$1.02

Food Waste Management Lookup Tables

#DIV/0!

Combo Box Lookup Table

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Possible Answers	Grocery Store	Northeast	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Restaurant	Mid-Atlantic	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	University	South																						
	Hospital	Midwest																						
	K-12 School	South-Central																						
	Prison	West-Central																						
	Other Cafeteria	West																						
	Other																							
Result	Grocery Store	Northeast	No					No						No						No		No	No	

	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Possible Answers	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Pounds	Flat Fee	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Finance	Finance	By Weight	By Weight	By Weight	By Weight
	No	No	No		No	No	No	No	No	Gallons	By Weight	No	No	No	No	No	No	No	Outright	Outright	Per Trip	Per Trip	Per Trip	Per Trip
											Per Pull										Flat Fee	Flat Fee	Flat Fee	Flat Fee
											In Rent													
Result					No					Pounds	By Weight				No									

Food Waste Separation

Tons of Foods Scraps Separated
0

Non-Perishable Food

Possible?	Food bank cost per year	Total annual cost of disposal under the alternative scenario	Cost Effective?	Result
No	$ -	$ -	Yes	Disposal

Pre-Consumer Prepared/Whole Foods Alone (used if going to food rescue only)

Type	Possible?	Alternative Treatment Costs Under Alternative Scenario (No Separation Costs)	Disposal Costs Under Alternative Scenario (No Separation Costs)	Cost Effective Over 10 Years?	Alternative or Disposal?	Result	Cost per year
Food Rescue	No	$0.00	$ -	Yes	Disposal	Disposal	With Food Scraps

Food Scraps Alone (used if pre-consumer prepared/whole foods are going to food rescue)

Type	Possible?	Initial Cost	Alternative Treatment Costs Under Alternative Scenario (No Separation Costs)	Disposal Costs Under Alternative Scenario (No Separation Costs)	Cost Effective Over 10 Years?	Alternative or Disposal?	Composting Preference	Result	Total cost per year of result	Pulp?
Feed Animals	No	-	$0	$0	Yes	Disposal				
Outdoor Compost	No	-	$0	$0	Yes	Disposal				
In-Vessel Compost	No	$39,000	$0	$0	No	Disposal				
Off-Site Compost	No	-	$0	$0	Yes	Disposal		Disposal	$0	

Prepared Foods and Food Scraps Handled Together

Type	Possible?	Initial Cost	Alternative Treatment Costs Under Alternative Scenario (No Separation Costs)	Disposal Costs Under Alternative Scenario (No Separation Costs)	Cost Effective Over 10 Years?	Alternative or Disposal?	Composting Preference	Result	Total Cost Per Year of Result	Pulp?
Feed Animals	No	-	$0	$0	Yes	Disposal				
Outdoor Compost	No	-	$0	$0	Yes	Disposal				
In-Vessel Compost	No	39000.00	$370	$0	No	Disposal				
Off-Site Compost	No	-	$0	$0	Yes	Disposal		Disposal	$0	

Yellow Grease

Possible?	Biodiesel cost per year	Total annual cost of disposal under the alternative scenario	Cost Effective Over 10 Years?	Result
No	$0	$0	Yes	Disposal

Baseline Scenario Hauling Costs

Type	Possible?	Fixed Cost	Per Ton Cost	Fixed Cost Result	Per Ton Cost Result
Flat Fee	No	$0	$0.00		
By Weight	Yes	$0.00	$0.00		
Per Pull	No	$0.00	$0.00		
In Rent	No	$0	$0.00	$0	$0

Alternative Scenario Hauling Costs: Reduced Fixed Costs Per Ton of Food Waste Diverted

Type	Type Result	Total Tons of Food Waste Per Year Before Source	Reduced Fixed Costs Per Ton of Food Waste Diverted	Result	
Flat Fee			$0		
By Weight			$0		
Per Pull			$0		
In Rent	By Weight	0	$0	$0	

Pulping Costs

Type	Possible?	System	Initial Cost of Pulper	Annual Payment on Loan	Total Annual Cost of Pulping	Adjustment in 10-Year Payment for Loans Under 10 Years	Avoided Tons of Food Waste Water From Pulping	Avoided Hauling Cost From Pulping	Cost Effective Over 10 Years?	Result	Total Reduced Fixed Cost of Hauling	Total Reduced Per Ton and Fixed Cost of Hauling	Initial Cost of System
Composting Prepared	No				$0	$0	0	$0.00	No	No	-	-	
Composting Scraps	No				$0	$0	0	$0.00	No	No	-	-	
Composting Combined	No			$0	$0	$0	0	$0.00	No	No	-	-	
Disposal Prepared	No				$0	$0	0	$0.00	No	No	$0	$0.00	
Disposal Scraps	No				$0	$0	0	$0.00	No	No	$0	$0.00	
Disposal Combined	No	Small Pulper	$24,062	$0	$0	$0	0	$0.00	No	No	$0	$0.00	$24,062

In-Vessel Costs

Type	Possible?	Initial Cost	Annual Payment on Loan	Adjustment in 10-Year Payment for Loans Under 10 Years (Savings)	Total Annual Energy Cost	Total Annual Labor Cost	Annual Maintenance and Repair of Composter	Total Annual Cost of In-Vessel Composting	Avoided Hauling Cost Due to In-Vessel Composting	Cost Effective Over 10 Years?	Result	Half of Annual Payment
Prepared	No			$0	$0.00	$0	$370	$0	$0	Yes	No	
Scraps	No			$0	$0.00	$0	$370	$0	$0	Yes	No	
Combined	No	$39,000	$0	$0	$0.00	$0	$370	$370	$0	No	No	$0.00

Alternative Scenario Fixed Hauling Cost

Type	Total Tons Before Source Reduction	Total Tons After Source Reduction	Hauled?	Tons of Foods Avoided	Total Reduction in Fixed Hauling Cost
Non-Perishable	0	0.0	Yes	0	$0
Prepared Food	0	0.0	Yes	0	$0
Food Scraps	0	0.0	Yes	0	$0
Yellow Grease	0	0.0	Yes	0	$0
Total	**0**	**0**	-	**0**	**$0**

Adjustment

Type	Prepared	Scraps
In-Vessel	0.00	0.00
Pulp Disposal	0.00	0.00
Pulp Off-Site	0.00	0.00

Food Waste Separation Cost Per Pound - 10 Year Multiplier

$0.93

Sample Waste Logbook

Date:	Weather:
Notes/Special Events Today:	

Time	Recorded By	Food Type	Loss Reason	# of Portions	# of Quarts	# of Pounds
				PICK ONE		
			TOTAL	0	0	0

Logbook provided by LeanPath, Inc.